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ASSISTED BY

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AMERICAN VETERINARY REVIEW,
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ORIGINAL ARTICLES.

ADDRESS

DELIVERED AT THE ANNUAL EXERCISES OF THE

AMERICAN VETERINARY COLLEGE,

BY PROF. J. C. DALTON, M.D.,
OF THE COLLEGE OF PHYSICIANS AND SURGEONS, NEW YORK CITY.

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Mr. President, and Gentlemen of the Class: It gives me great pleasure to meet you on the occasion of your graduating from this school of Veterinary Medicine. I do not doubt that, on your part, you feel a sense of gratification at having finished your period of pupilage, and in looking forward to a life of practical activity. I hope you have fully enjoyed your time of study, which has passed, and I trust you will have an abundant success in the future. In fact, this is one of the most interesting epochs in the life of every man who devotes himself to any department of medical science or art. He has gone through with his preliminary studies, and has gained a certain insight into a subject which at first seemed altogether confused and difficult. And I am certain that during the period of your instruction here, you have been convinced of at least one thing beyond a question; and that is, that the more you learn, the more knowledge you find there is to be acquired. No man can hope to follow with success such an occupation as yours without feeling a love for it, and appreciating how much there is in it to deserve his devotion and industry. There is no danger that you will ever find it exhausted. There will always be something to add, or improve, or complete; and the more you do of this, the better you will deserve your success.

Now, gentlemen, what have you been doing here for the last two years? You have been putting yourselves in a position to understand the business you are to follow. You know very well that it is useless for a man to try to do anything without knowing from the start exactly what he is about. Under the guidance and instruction of your professors, you began at the beginning, and so laid the foundation of your veterinary knowledge. You first made yourselves acquainted with anatomy. The construction of the animal machine is the first thing essential for you to know; because it is a machine which you undertake to keep in order, and it would be wasting time to try that, until you understand it in all its parts. The form and texture of the bones, the mechanism of the joints, the strength and position of the muscles and ligaments, where they are visible externally, how they hold the body together and enable it to move this way or that; all these are perhaps the simplest of the things which you have studied, but for that very reason they were the first and the most important, for you could not get on without them.

Then came the physiological action of the different organs, the movements of circulation and respiration, the digestion of food, the growth of the parts, and all the extraordinary endowments of the nerves and senses.

So far, you were occupied in learning all you could about the healthy organism in its natural condition. And I suppose that much of your future practice will be embraced in this portion of the subject. The whole question of hygiene, of proper feeding and exercise, of stabling and grooming, and of breeding and raising, so as to get the highest development of strong and healthy qualities, comes entirely within the range of strictly anatomical and physiological knowledge. Even in a practical point of view, therefore, this is by no means the least important part of your education.

But you will also be largely interested in the cure or alleviation of maladies; and the next step is to learn what these maladies are. For the diseases and morbid affections of the animal frame have a natural history, like its healthy functions. They do not come by accident or helter-skelter; but every one has a defi-

nite cause, and a particular progress and termination, and is known by its signs and effects, as much so as the natural actions going on in the living body. All these things you have studied, and with them you have been taught the instruments and remedies of the veterinary art, and how to use them to the best purpose.

You have also had the indispensable advantage of clinical instruction. It is one thing to read about a disease, or to hear of it in a lecture, and another thing to have it shown to you, so that you will know it yourselves when you see it afterward. This is true in all the departments of medical study—in anatomy, in physiology, in pathology and in practice. Reading about a thing or hearing of it, to be sure, is better than nothing; and the student must always begin in that way. But when he has once seen the thing, and seen it intelligently, he knows it in a very different way from what he did before. Then he appreciates it as a reality; and beside that, it is impressed on his memory, so that he could not forget it if he tried. I have no doubt that you remember your clinical instruction in the Veterinary Hospital as among the most valuable and lasting benefits derived from your whole course of education.

I presume that I hardly need to congratulate you on the kind of work you have chosen for the business of your lives. Anything as useful and important as Veterinary Medicine and Surgery is abundantly worthy the best attention of its practitioners. But it has some features which make it particularly attractive. The largest portion of your practical skill will be called in requisition for the treatment of the horse; and this noblest and most valuable of the domesticated animals will be the principal object of your care. Ever since literature and poetry existed, he has been the object of praise for his strength, symmetry, speed, and docility. He is the companion of man as well as his servant, and his qualities have always commanded our interest and admiration. I do not think that the horse, as compared with other animals, has a very high degree of general intelligence. His capacities are limited in direction, and confined, for the most part, to matters connected with his useful employment. But he makes up

for this by the beauty of his organization, his willingness of disposition, and the admirable way in which he is adapted to the work he has to perform. All he wants is to know what his master expects of him, and he is ready to do it, by an instinct which is part of his nature. No doubt there are vicious horses, as there are vicious men; and for both of them punishment is the best remedy. But this is the exception in one case as well as the other. At least nine times out of ten, when a horse does not do the right thing, it is because he does not understand what is wanted of him; and if he can be quietly shown this by any means, he is only too glad to be put on the right track. You will probably have frequent opportunity as veterinarians, to observe the peculiarities of nervous organization in different animals. They are not all alike in this respect, and a knowledge of their variations in temper, intelligence or excitability, may sometimes be useful in a medical point of view. The indepenence of some animals, the sociability of others, the quickness and impressibility of some, and the comparatively phlegmatic disposition of others, are always interesting things to notice, and, when we understand them, make it all the easier to treat the animal or use him to the best advantage. Even when a horse is sometimes a little capricious or light-headed, I do not think that a very serious fault. It is usually a temporary matter, and when the animal has kicked up his heels a few times he is generally satisfied in his mind and ready to go along quietly for the rest of the day.

But your usefulness as practitioners will not be confined to the horse. You will be called upon for advice and treatment for the other domestic animals. And in regard to all those used for purposes of draft or food, you will have to do with interests of high value to the wealth of the country. Beside the ordinary affections to which these animals are liable, there is a further subject of great importance and scientific interest, which comes directly within the range of veterinary medicine. That is the subject of parasites. These creatures are often the pests of the farmer and the stock-breeder. They are lurking vagabonds and intruders, that insinuate themselves secretly into the bodies of higher ani-

mals. They may be only a source of debility or inconvenience, but they are sometimes destructive and fatal to an excessive degree. There are not many of them, I believe, that infest the horse, and but few that do much damage to the ox; but in the sheep they are sometimes abundant and dangerous, and the pig, as you know, is their favorite stamping-ground. They are microscopic in size, and often difficult to detect, because they enter the body by unsuspected channels, and only become dangerous after a time, when they have altered or multiplied in the process of growth. Consequently it is of the first importance to know the beginning of these maladies, and how to avert them at the outset. Sheep-raising is one of the most valuable industries, but it has this drawback; that the sheep is a delicate animal and subject to decimation by various diseases. Two of the worst of these diseases are parasitic—Dropsy-rot, caused by liver-flukes, and the Staggers, caused by cœnurus cerebralis. In England, the Dropsy-rot carries off large numbers of sheep every year, and in the epidemic of 1830 the loss was estimated at a million and a half of animals. In another epidemic one extensive breeder in the isle of Thanet lost $15,000 worth of sheep from this cause; and in France, in 1853 and '54, the farmers lost from a quarter to three-quarters of their entire flocks.

This gives us an idea of how much injury may be done and how much property may be destroyed by the ravages of minute parasites when they become numerous. But the question sometimes touches our interest still more closely. The contamination of our food by the parasites Cysticercus and Trichina makes the infection of domestic animals also dangerous to man. Here veterinary pathology and human pathology come together, and there is a wide field open for increased usefulness of the veterinay art.

Take the case of Trichina Spiralis. That parasite was first discovered many years ago as an inhabitant of the human muscle. But it was thought to be harmless, because it was only found in patients who had survived the original attack and had died years afterward, from some other cause. The fatal cases were not understood, and were not even recognized at all, as produced by the parasite. But at last, by a series of laborious

experiments and observations, it was ascertained where the parasite came from, and how much damage it was capable of doing. This is one of the cases where the most important thing of all is to know the *cause* of the difficulty, because then we can guard against it. Before 1860 we were constantly exposed to a revolting and dangerous disease, without any means of protection. Now that we know where the infection of trichina comes from, we are perfectly safe, if we will only be careful about the preparation of the food, and be sure that it is properly cooked.

But there are always people who will not be careful, and even many who are still ignorant of where and what the danger is. And something yet remains for all of us to learn about it. We know now that a man gets his trichina-disease from eating the uncooked flesh of a trichinous pig. But where does the pig get it? If pigs ate each other, or devoured men, we could understand how the breed of trichina might be propagated. But they do neither. Suppose there are now, in the United States, 20,000,000 pigs, and that 100,000 of these are trichinous. At the end of five years from this time, not one of those pigs will be alive; and yet it is abundantly certain that there will be just about as many trichinous pigs then as there are at present. Now from what possible source can these new animals, not yet born, derive their infection? It must come from somewhere; and if we knew its source we might, perhaps, prevent it, and thus strangle the disease in its breeding-place. But we do not know. There are surmises on this subject, but no real information. The man who ascertains this important fact will do a benefit to his country and a credit to his profession.

This brings us to another topic which has been growing for some years into great prominence. That is, the subject of Preventive Medicine. It is the business of all practitioners who have to do with diseases of either man or animals, not only to cure these diseases, but also to guard against them. We are able to do this just in proportion to our knowledge of the natural history and especially the causes of a malady. The value of this knowledge becomes very evident when we think of the interests of the community in general, or even of large owners or breeders of

stock; and also of the loss caused by epidemics. For the owner of a single sick or lame horse, it is most important that his animal should be cured of that particular malady. But for the country at large it is of much more consequence to prevent its recurrence, or to avoid its coming as an epidemic. In all contagious or infectious diseases this is especially important; and in performing such a service veterinary medicine will do its greatest amount of good.

There is a vulgar notion that to prevent disease would be against the interest of the veterinarian, because it would lessen the number of his patients. I need hardly ask you to repudiate this idea, not only because it is degrading, but also because it is false. A man would more gladly pay for keeping all his horses and cattle sound, than for curing some of them after they are sick. There is no danger that the owners of animals will not always need the advice and skill of the veterinarian. Diseases of all kinds, and especially epidemics, are a disaster to the animal wealth of the country. They diminish the number of valuable animals, and interfere with the prosperity of their owners. It is for the interest of veterinarians as a class that the production of horses and cattle should be abundant; and the more numerous and valuable these animals are in a country, the more important and remunerative will be the business of the veterinarian. Beside, the more good veterinary medicine shows itself capable of accomplishing in this respect, the higher will it stand in the estimation of the public; and this alone cannot fail to increase the consideration and prosperity of its practitioners. What we call preventive medicine and conservative surgery are acknowledged to be the highest practical applications of the medical art in every department.

Finally, gentlemen, let me offer you a few suggestions as to your own future prospects, and what will be most likely to ensure your success. I presume of course, that you have made good use of your time here, that you expect to keep on learning hereafter, and that you are sincerely devoted to the business you have chosen. All these things are essential, and I take them for

granted. But, furthermore, I believe there are two things upon which your future success will mainly depend.

The first is, the *accuracy* of the knowledge which you acquire on any particular subject. There is a great difference in this respect. One man will learn a thing and remember it pretty well in a general way, but without having any very definite idea of the particulars. Another will do it so that he knows exactly how much he has learned, and what the evidence of it was, and what are the figures and quantities essential to the result. He knows precisely where his information on that subject begins and where it ends; how much of it is certain and how much doubtful. Now that is the only kind of knowledge that will be of much use in the long run. It is harder to acquire, of course; but it is worth a great deal more after you have got it. And where two men come in contact, if the knowledge possessed by one is indefinite and that of the other exact, there is no doubt at all which of them will carry the day. Natural quickness or facility of apprehension is a good thing, but it will not compensate for the want of precise knowledge. It is better to make a mistake and have a good reason for it, than to guess right not knowing why. And the reason is that when a man with the right kind of knowledge makes a mistake, he finds out that he has made it, and what is more, he knows why he made it, and just where the difficulty was. Such a man is always improving; and at the end of ten years, in the slow race for superiority, he will have passed his clever competitor and left him out of sight.

The second quality which is of most value for a practitioner, and for his patients too, is what we call a *good judgment.* In common parlance, it is spoken of as a "level-head." I do not know how that phrase originated, but it conveys the idea extremely well. It means the power and habit of appreciating what is really important in a thing and what is not; of paying attention to what a thing is, rather than to the name it goes by; and of distinguishing, among several causes, which is the real one, and which are only incidental. The man who does this takes hold of his business by the handle, and will probably accomplish something; because the result he gets, if he succeeds

at all, is the one he set out for. When you are called to see a patient, there are always a variety of things that may be the source of his malady, and you want to know, as certainly as possible, which is the one at the bottom of it. During the course of the disease, it is often of great consequence to know whether a new symptom be really a dangerous one, or only due to some temporary irritation. If you can decide this correctly, of course it will make a great deal of difference in your treatment and in the result. This quality depends in some measure on natural capacity; but it also depends on the habit of taking everything as it comes without examination, or of looking to see what is the cause of it, and what it means. The man who exercises his judgment in this respect gives the patient the benefit both of his knowledge and his skill. The man who does not, is what they call a "routine practitioner." He goes by rote; and he is like the books that some people keep in their houses, such as *Gunn's Domestic Medicine*; or, *Every man his own Cattle Doctor*, where all you have to do is to look out the title of the disease, page 104, and then give the physic put down as good for it. The healing art cannot be practised in that way, either on animals or man.

Not long ago I heard a story of this sort. There were two friends, Dr. A. and Dr. B. Dr. A. lived in the town and drove his buggy. Dr. B. lived in the country and generally went on horseback. Dr. A. was well read and tolerably popular, but he had great confidence in his friend's practical skill and discretion. So once, having a patient very ill with dysentery, he sought the advice of Dr. B., who happened to be in town; saying that he had given the patient several doses of cathartic medicine, but without good effect. Dr. B. said he thought opium would be a good thing to administer, and so it proved, for the patient got well under that treatment. A year afterward Dr. A. had another bad case of dysentery, and again called Dr. B in consultation. He said the patient had been taking opiates for some days, but was still growing worse. Dr. B. advised castor oil. "Well," said A., "I'll give it, if you say so. But last year, when I had a case of dysentery, you told me to stop the cathartics and give opium.

Now you tell me to stop the opium and give a cathartic. Really, I don't understand that, and I wish you'd explain."

"Why," said B., "you remind me of my old horse. A while ago, in the month of April, I had been away some eight or ten miles to see a patient, and passing a brook on my return, thought I would give my horse a drink. It had been thawing and raining then for a fortnight. The road was a bed of mud, and the track down to the brook a perfect slough of despond. However, I picked my way down, leading the horse after me. But he was heavier than I, and sunk in the mud. Then he began to struggle and went deeper at every step; and at last he gave it up and sat down on his haunches, completely mired and half frightened to death. I had to wait till a man came along to help me, when we lifted the animal out with a couple of fence-rails and got him on his legs again, and I took him home. That was three years ago. Last December I had to visit the same patient again; and coming back by the brook, again thought I would water my horse. There was no snow in that part of the country, and it had been freezing hard for a fortnight. The road and the track down to the brook were like so much granite; and the brook had a narrow edging of solid ice, with a little stream in the middle, about six inches wide. As I was leading the way down, I felt the horse bear on the reins, and, looking back, I saw him planted there like a rock. He declined to come any farther, and all my pulling would not make him stir an inch. That puzzled me, until I recollected what had happened at the same place three years before. Then I made a speech to the animal, and expressed my opinion of him in these words: 'Old horse,' said I, 'it strikes me that you have a first-rate memory, but an infernally poor judgment.'"

I believe his friend did not ask him any more, why he treated those two cases of dysentery in a different way.

Now, gentlemen, I will not keep you waiting any longer. I only have to offer you, in conclusion, my thanks for your attention, and my good wishes for your future success.

This address being received by warm applause, Prof. J. W. S.

Arnold, M.D., of the University Medical College of New York City, was introduced, and delivered the following remarks:

It gives me great pleasure, gentlemen of the American Veterinary College, to say a few words on the present occasion. Perhaps I am influenced in your favor, for the reason that so much good physiological work has been done in veterinary schools, by *veterinary men.*

But though the physiologist is especially interested on this account, the profession of *medicine generally must* also appreciate your vocation. Veterinary science is undoubtedly a branch of medical science, and not only does its influence extend to the preservation of the domestic animals used as "*beasts of burden*," but also to those upon which omnivorous man depends so largely for his food.

The physician prescribes for his patient, both the administration of drugs and medicines and by carefully regulating his diet; now, then, a part of *your* profession is to preserve and improve the healthy condition of edible animals: in this manner do you perform *your part with* the physician.

You have entrusted to your care the wealth of a large portion of the community, inasmuch as it forms a part of your duty to prescribe for the diseases of all kinds of live stock. You must diagnose, treat and prognose for your mute patients just as the physician does for his fellow man. It is your part to take cognizance of epidemics, endemics, contagious and infectious diseases, and in fact to look carefully after every form of disturbance in the lower animals which can be transmitted from one species to another, and from these even to man himself.

Thus it is for *you* to perform the work of sanitarians. The community at large should then acknowledge the position which you occupy, and it is for you, gentlemen, to gain its full confidence and respect by your own actions—by your own achievements. The tendency of medicine in our country seems to be towards the direct accomplishment of practical results—the desire is to cure. There is but one way, however to reach our goal, there is but one way to further the interests and increase the proficiency of

medical science. We cannot resort to a mathematical solution of our problem, nor is it possible to foretell the effect of a new remedy (or sometimes of an old one).

Who would expect to repair a delicate and complicated piece of machinery without first becoming thoroughly familiar with its construction, purpose and all that pertains to it? The chances are that the unqualified mechanic would utterly fail in any such attempt; but the skilled artisan would discover without fail the missing or broken part, and by appropriate means restore the mechanism to its original condition.

The same principle holds good in medicine; a knowledge of anatomy, chemistry and physiology must first be obtained; then, upon these three foundation stones can the structure be reared. But yet, as our edifice of medical science is not by any means perfected—far from it; the building is in need of many additions as well as alterations. During the years of its actual existence it has suffered many changes, its supports and walls have been pulled down and built up again to give it more perfect strength and symmetry.

And yet, we must, upon critical examination, come to the conclusion that our foundation stones are not rightly placed. Anatomy, or at least some of its subdivisions, are almost exhausted, animal chemistry and its near relative, pharmacological chemistry, are but in their infancy, and physiology, although beginning to take its place among the foremost departments of medical science, is still an unfinished pillar in our edifice. To the advancement of *experimental medicine* must be looked for the greater perfection of *practical medicine*. The rehearsal of cases, which crowd our medical journals, do little or no good to the cause; the fashion is to hurry into print an account of the first case which comes into the hands of the young practitioner. To what end? Why, to waste paper and ink in most instances. Let it not be inferred from what has been stated, that physiology is the only important branch to be pursued; but may the fact be appreciated that almost every advance in practical medicine has been preceded by some new development in physiology. It is but necessary to glance at what vivisection alone has accomplished, to perceive how errors have

been corrected in the treatment of disease, and new factors introduced, making advances in the right direction.

Before the functions of the portio dura of the 7th pair were known, surgeons used to cut this nerve for the relief of neuralgia.

A knowledge of the circulation of the blood and cardiac move ments speak their own importance full well, and what good has resulted therefrom in the cure of disease, and in the amelioration of suffering! The classical experiments upon respiration, the relations of animal life to the surrounding atmosphere, and the mutual dependence of plant and animal, must be credited to the physiological laboratory. Whatever of good has come or may come from the transfusion of blood, should be ceded to Boyle and Lewis, who, more than two centuries ago, performed the experiment upon the lower animals, to determine the propriety of attempting the same in man. Hunter's ligature of arteries for aneurism, and the periosteal reproduction of bone, are but a few of the examples of great principles developed from experimental physiology. Not only does experimentation in this respect establish the groundwork upon which the details may be elaborated, but it suggests another mode of inquiry—the therapeutical effect of drugs and medicines. Ether, chloroform, chloral and many more most valuable remedies have entered the list, after first having their effects tried upon the inferior animals. The problem then seems demonstrated that medical science, as a whole, must look to continued and carefully conducted experimentation for its material advance, and the departments which require to be built up most are animal and vegetable chemistry, physiological therapeutics, with experimental physiology generally.

We require a knowledge of how remedies act in the body, both in disease and in health, for the means of diagnosis of disease are far in advance of the treatment of the same. The fact of the treatment of disease in the lower animals seems to suggest the propriety of experimentation in the directions just indicated, and the truth is spoken when the statement is made, that some of the most important and brilliant discoveries and researches have been in Veterinary institutions. The schools of Lyons and Alfert have already done much to advance medical science. Such names

as Chauvreau, Bertolus, Laroyenne, Colin and Banvillet, connected either directly or indirectly with veterinary science, are sufficient to guarantee the high order of intellect devoted to this branch in France, while the Brown institution in London is doing famous work in investigating the diseases of animals under the auspices of Burden Sanderson and Dr. E. Klein.

And now, what can be said of what is being done here in *our* own land to further scientific medicine, or offer inducement to those who are willing to devote their energies to such a noble enterprise? A truthful answer would be of no flattering character, for we shall find that not only the community at large, but those who are in the ranks of medical men, be the horse doctors or man doctors, either take no interest in these higher studies, or being ignorant or indolent, they decry true scientific work because they can see no practical application. This desire for instantaneous practical results is the damnation of true science; the telegraph, the steam engine were not developed by men of commercial minds, but by those who, seeking diligently for knowledge, which is truth, found the precious treasure, and being pure of heart, gave to their fellow men the result of their labors.

There are, however, many of the profession, here with us, who pursue their way in life with the earnest effort to be true scientific men, and may the good example of these serve you, gentlemen, in your professional career, and cause you to cherish science to the best of your abilities. Seek not for practical results too soon, but rather try and add to the facts already at our command, some that are still unknown. The encouragement of science must come from professional men themselves, at least for a time; the non-professional man is unable to comprehend the expediency of money spent on abstract science; he must be educated to see this necessity by those of his professional brethren whom he respects and confides in. You, gentlemen of the Veterinary profession here, have a most fortunate opportunity to do your part in arousing the interest of your clients, because, from the very nature of the responsibilities imposed upon you in curing diseases of domestic animals, you can demonstrate to the commercial mind how necessary it is that Veterinary science should be extended,

inasmuch as by so doing the wealth of the community is increased. Give your support to the establishment of institutions devoted to experimental medicine *here in this country*, in this *city*, and you will be benefitted therefrom, not only directly in your special profession, but in the better sanitary and pecuniary state of the entire land.

A CONTRIBUTION TO THE PATHOLOGY OF THE PULMONARY DISEASES OF THE HORSE.

By PROF. DR. SCHÜTZ,

PATHOLOGIST AND PATHOLOGICAL ANATOMIST OF THE ROYAL VETERINARY INSTITUTE, BERLIN.

Translated from the German by F. S. BILLINGS, of Boston.

(*Original in the Archiv fur Thierheilkunde, Band II, S.* 80.

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As known, the lungs of the fœtus are now filled with air, the air first gaining access to the lungs of the young animal after birth. When authors speak of that condition of the lungs by which they contain no air as atelectasis, they are not exactly correct. By lungs we understand the functioning, that is, respiring part of the respiratory apparatus in which takes place the gas exchange between the atmospheric air and the blood. The alveolæ of the lungs are filled with air, after birth, as well by the inspiration as by the expiration, and only under pathological conditions is the place taken by the air assumed by other masses, as blood, cells, water, fibrin, etc. When the alveolæ of the lungs are filled with blood, we speak of a *hæmorrhagic infarctus*, when they are filled with cells or fibrin, (and the lungs have the consistency (to palpitation) of the liver) of an *hepatisation*, when the alveolæ are filled with water of pulmonary ædema, *hydrops pulmonum*.

It is self-evident, that the filling of the alveolæ of the lungs with blood, cells, fibrin, water, etc., causes a non-atmospheric condition of the same, but that is no atelectasis. *Atelectasis is that*

condition of the lungs by uhich the alveolæ do not contain any air, or in the place of the air any other elements whatever; in other words, they contain nothing, are collapsed, non-distended. The lungs of the fœtus exemplify this condition, and we therefore name the fœtal condition (État fœtal, Legendre.) of the lungs a *natural atelectasis.*

The aim of respiration is to convey the oxygen of the air to the blood, and to take up from the same the end products of the processes of oxydation, especially the carbonic acid, and give them up to the external atmosphere. The lungs are in connection with the external world by means of the bronchi, the trachea, the larynx, and the nasal cavities. We must then look upon these parts as the respiration's way, the connective-tube between the lungs and the atmospheric air. From this consideration it results that the diameter of this respiratory-way decides how much atmosphere may gain access to the lungs with each respiration. The results of different measurements indicates that the diameter of this connective-tube stands in a certain relation to the size of the lungs, and that the size of lungs stands in a certain relation to the size of the body.

To the completion of normal respiration, a normal diameter of the respiratory-tube is necessary, and every considerable constriction of the same must necessarily produce a disturbance in the execution of the respiratory functions. When this connective-tube is obstructed, the entrance of the air into the lungs cannot take place. Such a condition may take place during the birth of the young animal. The young are forced out by the contraction of the uterus, but at first the uterus does not act upon the fœtus, but upon the liquor amnii. The orificium uteri is distended by that part of the fœtal meninges which obstetricians designate as the "blase" bladder. Later, the head of the fœtus is pushed into the distended orificium, and finally the fœtus is born. The young, while intra-uteral, draws its necessary oxygen from the placental blood of the mother, but this gaseous-exchange between the blood of the young and that of the mother is only possible when the way by which the blood passes from the mother to the fœtus, and *vice versa*, is unobstructed. As soon as the young is born, also

when the union with the mother by means of the funiculus umbilicalis still continues, the supply of oxygen from the mother ceases, on account of the contraction of the uterus; the contraction of the uterus conditions a compression of the vessels. A proof of the correctness of this assertion, is given by the observation that the fœtus begins to respire, and aspires the liquor amnii, if the fun. umbilicalis be compressed. The supply of air to the lungs is only possible, however, when the passage to the same is open. When the last is completely closed, no respiration whatever can take place, and the young dies during or at once after birth. If parts of the respiratory-tube are obstructed, then the young cannot breath with the parts of the lungs in connection with same, such parts remain empty *atelectatic*. This is *con*-genital atelectasis, that is, the lungs or single sections of the same remain in the fœtal condition.

The mechanical acts of respiration are also important in considering the process of respiration. These are the respiratory movements. Different powers serve to perform the business of in- and expiration, to which it is necessary for us to give a moment's attention. The lungs lie in relation with the inner surface of the thoracic parietes. When the thorax widens, the lungs distend themselves, and the distention of the lungs exactly corresponds to the extension of the thorax. A dilution of the air in the lungs must then take place in consequence of the extension of the thorax, and the succeeding distension of the lungs, upon which follows an in-streaming of the external air by means of the respiratory-tube. This in-streaming of the external air in the lungs continues until the equilibrium, or, as Donders remarks, until an equal tension of all the alveolæ, and an equal distribution of the pressure to all parts has taken place. The lungs do not, therefore, deport themselves by inspiration in an active, but in a passive manner; they are extended by means of the atmospheric pressure, and resist the same by means of their elasticity. This resistance, which the pulmonic tissues offer to the atmospheric pressure; that is, the endeavor of the lungs to contract or retain themselves in their natural volume, is called the *negative pressure*.

The inspiration is interposed by means of muscular force, the

following muscles taking especial part in this phenomena, viz: the diaphragma, the scaleni, the inter-costales externi and interni. Expiration takes place without the interposition of muscular force; the most essential expiratory force being the elasticity of the pulmonic tissues themselves. The inspiration's muscles relax, and the lungs which have been distended have, on account of their own elasticity, the tendency (endeavor) to again assume the volume they had at the time of the last completed expiration. While the elasticity is a hindrance to the inspiratory extension of the lungs, it is the chief motor in the performance of the expiratory act. The endeavor of the lungs to contract themselves, has not by any means ended with the termination of the expiration, as we shall presently see.

As the inspiration is affected only by means of muscular force, it must then essentially depend on the condition of the muscles for inspiration, whether on coming into the world the young animal can sufficiently widen the iudividual sections of its thorax or not. *Unfortunately, we do not at present possess any satisfactory measurements of the excursions of the single sections of the thorax.* Experience has, however, taught us that sections of the lungs, of more or less extent, remain in a fœtal, that is atelectatic, condition, when the inspiration's muscles do not sufficiently work after the birth of the young; that is, all parts of the lungs are not equally extended.

Roloff found by young pigs immediately after birth, and even by not yet developed fœtus, the entire straited musculature in a condition of fatty metamorphoses; consequently in a condition unsuitable to perform its functions. These animals could only inspire imperfectly, or not at all. Many animals therefore perished at once, or soon after birth, in consequence of insufficient respiration. The lungs of the dead animals appeared, as a rule, in desiccated atelectatic condition, ("in der Regel trocken.") The lungs will then remain in a fœtal condition: 1st. When the inspiration muscles have suffered pathic metamorphosis, and every extension of the thorax is impossible; or, 2d. When the respiratory tract, the connective-tube between the lungs and the external air, is obstructed. The nature of the changes of the inspira-

tion muscles, and the more or less complete obstruction of the respiratory way, would therefore decide the extent of atelectasis. Have single inspiration muscles suffered pathic changes of an inferior grade? then the respiration is only partially disturbed. The lungs are then only atelectatic here and there. Or, are only individual bronchi obstructed, that is, the connective-tube is only partially obstructed? then the atelectasis would only come to observation in those parts of the lungs to which the bronchi in question lead. We find the obstruction of single bronchi by *congenital bronchitis catarrhalis*. I have to the present time met with bronchitis congenitalis only by calves, and would infer (with Frank) that the aspiration of the liquor amnii may be looked upon as the cause of the same. Every bronchitis gives a secrete. The number of diseased bronchi may vary, and corresponding to the same would be the extent and number which would be obstructed. The atelectasis following bronchitis is not alone conditioned by the secretory products, mucous, pus, etc., but other circumstances all aid in producing it. Every irritation of a mucous membrane causes tumefaction of the same, and this swelling is of itself sufficient to obstruct the lumen of very narrow canals lined with a mucous membrane. Further, the functional capability of the respiration muscles is of importance. When the respiratory forces are sufficient to cause the extension of the thorax of a new born animal, then the hindernesses to the respiration caused by the catarrh may be overcome, by the powerful respiration. By a weak animal, however, the musculature of which is but poorly developed, poorly nourished, or has suffered pathic metamorphoses, that is, one by which the act of respiration is but weakly executed, the obstructions of the bronchi cannot be overcome. It is by such animals especially, that the lungs remain to a greater or less extent in a fœtal condition. The last is known as congenital atelectasis. Congenital atelectasis was for a long time looked upon as a congenital form of pneumonia. Jorg was the first to correctly consider the atelectatic condition of the lungs and to recognize the same as the result of an insufficient filling of the alveolœ with air.

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This comes to—comes in a lung which has already breathed, and in such places in which the supply of air has been shut off. The mere interruption of the supply of air is not, however, sufficient to make a part of the lungs atelectatic of an animal which has already breathed; in this case the obstruction of the respiratory canal is only a condition to atelectasis. The latter will first come to pass when the air posterior to the point obstructed is removed. The removal of the air takes place as follows:

By the fœtus the lungs are in an atelectatic condition, that is, the alveolæ and bronceoli are so much collapsed that the parietes of the same are in opposition with each other. Authors have, in times past, considered that the alveolic tissue was made up only of connective tissue and elastic fibres, and that muscle fibres were only to be found in the bronchi. Moleschatt and Piso Borne have, however, shown that non-striated muscle fibres also enter into the construction of the parietes of the alveolæ. F. E. Schulze has described at length the distribution of the same in the lungs. From this anatomical construction of the lungs, it results that the latter are not alone elastic, but also contractile. The part these muscle-fibres play by the expiration is as yet undecided. Brücke says, "*the quiet expiration results through elastic force.*"

Upon the lungs we distinguish the highest state of inspiration and the most profound state of expiration. In the first the thoracic cavity and lungs acquire their greatest extension, and the lungs their most extreme amount of air. The most profound state of expiration is exactly the opposite. In this the lungs are but poorly filled with air, but they are not completely empty, by any means. The lungs of the cadaver are in the most profound state of expiration; in this condition they also have the tendency (endeavor) to still more contract, but the further contraction is hindered by the thoracic parietes. The most profound state of expiration is therefore no atelectasis. It makes no difference, therefore, in which moment of the in- or expiration the supply of air is interrupted by the obstruction of the air passage, as of a bronchus; in every case a part of the lungs filled with air would be shut off from the general air circulation in the lungs. In the course of time the air disappears from the excluded part of the

lungs, and then the latter becomes atelectatic. The question now before us is: How does the excluded part of the lungs get freed from its air? Here works the repeatedly quoted elasticity of the pulmonary tissues. The air in the excluded parts of the lungs finds itself under a constant pressure, and this conditions the absorption of the air.

Virchow was the first to advocate the view, that the air in the excluded parts of the lungs was absorbed by the fluid present in the same. This absorption process takes place here in the same manner as in the intestines. The absorbed air gains access to the blood, and is rapidly passed off by means of the lungs, as Bernard has shown. According to Traulee, nitrogen is not easily absorbed by the blood, and it appears as if the nitrogen in the intestines gained access to the blood easier through the mucosa of the same than by serous membrane, that is, the lungs. Investigations have shown that the air in such excluded parts of the lungs is at first always poorer in oxygen and richer in carbonic acid, and that then comes a period when only carbonic acid and nitrogen are to be found in the parts in question, and that finally these gases also become absorbed, the carbonic acid quicker than the nitrogen, however. The tonus of the tissue is one of the most important conditions for the absorption of the gases. Opposed to the tonus is the atonus, and both conditions are dependent upon the inner construction of the tissues. Authors, in times past, have designated these conditions of the tissues with "strictum" and "laxum." Tonus has reference to the dense and firm condition of well nourished parts. Tonus, says Virchow, is the character of a healthy, normal part, where the favorable condition bespeaks also a large amount of activity. The property of a part to retract itself, is known as its elasticity. Pulmonary tissue is able to retract itself, when in a good condition, powerfully and quickly; under the contrary circumstances, slowly and imperfectly. The lungs may lose their capability to retract; in such a case we speak of a collapsus of the lungs. *From this it is evident that atalectasis of the lungs must not be confounded with collapsus. A lung can only become atelectatic when it has the ability to retract itself*, that is, when it is elastic; it is only parts which have this ability which

can become atelectatic, after their supply of air has been shut off from the obstruction of a bronchus. The retraction of the lungs is an active process, which presupposes a normal character of the pulmonary tissue. Collapsus, however, indicates to us that the pulmonary tissues have lost their elasticity; by collapsus the lungs are in a passive condition. A healthy lung retracts by opening the thorax, and, indeed, because it is elastic; when this falling together (retraction) does not take place, then the air cannot get free from the lungs, because of the obstruction of the entrance, or because the lungs are in a state of collapsus. We must assume a pathic condition of the pulmonary tissue by collapsus, but this condition is not to be demonstrated anatomically. Only the disturbances in the physiological conditions of the lungs justify us in assuming disease of the parenchyma of the same. We cannot demonstrate, on such a lung, the normal crepitation which results by a normal elasticity of lungs, when we cause a slight compression of the air in the same.

The grade of elasticity of the lungs varies at different ages. The general results of experience are that the lungs of young animals are more elastic than those of old ones. The elasticity of the lungs diminishes with quantitative and qualitative use of the same; this fact explains to us why atelectasis develops more quickly by young animals, and is more frequently observed by the same, than by old ones.

According to Bartele, an obstructed part of the lungs becomes free from its enclosed air not only by means of the elasticity of its tissues, but also with the assistance of the bronchial muscles. It is his idea that the irritation of the bronchial mucosa causes a reflex contraction of the musculature of the same, and that this contraction accelerates the absorption of the air. Experience teaches that bronchitis catarrhalis is frequently followed by atelectasis, when the product of the bronchitis obstructs the lumina of the bronchi. This obstruction comes to pass more freely upon some bronchi than upon others. The primary reason for this is to be sought in the manner of construction of the thorax. The respiration by the horse is predominantly diaphragmatic, and the excursions of the ribs become greater in an anterio-posterior

direction, that is, from forward, backward. In general, however, the costal extension of the thorax is very small in comparison to the influence exerted upon the dimensions of the same by the diaphragma. The thorax will be extended the least, on such part, when it has the least elasticity and flexibility. Accordingly, the anterior and middle part of the same will suffer the least extension by inspiration; this is partly due to the arrangement of the ribs and partly to the hindrance to the same offered by the attachments and influence of the anterior extremities. If, therefore, the development of a catarrhalic secrete—mucous and pus—in the bronchi has taken place, the same will self-evidently accumulate in those parts of the lungs which are least agitated and extended by inspiration—the anterior and middle parts. In the inferior middle section of the lungs, or, according to Leisering, "where the inferior edges extend furthest downwards," an obstruction of the bronchi will most easily take place; because the secrete follows the laws of specific gravity, and must, therefore, sink to this, the lowest part. Aside from the form of the thorax, and the situation of the single sections of the lungs, *the character of the inspiration muscles is of importance.* This has been already considered. In proportion as the activity of these muscles is interfered with, so much the less will be the extension of the thorax, and this will be more apparent in regions where the normal excursions are the least. Therefore, *atelectasis will naturally take place after a bronchitis in those parts of the lungs where expectoration is mostly interfered with, that is, where obstruction of the bronchi can most easily take place.* We thus see that an acquired atelectatic condition may have a variable extension. A lobulus, or a part of the same, may be complicated; and, indeed, lobular atelectasis follows bronchiolitic catarrhalis, while partial lobular atelectasis follows a broncho-pneumonia. By the last the complication of the bronchi is the protopathic, while the complication of the lungs is the deuteropathic process; the process creeps from the bronchi to the alveolæ of the lungs. By broncho-pneumonia, the alveolæ around the bronchi are diseased, the central part of the lobulus suffers, while the peripheral remains intact. If the broncho-pneumonia processes lead to a long con-

tinued obstruction of the bronchioli, then the peripheral parts of the lobuli become atelectatic. The surface of the lungs then loses its smooth appearance. By pressing the fingers over the parts in question, we are able to feel the broncho-pneumonia centra, as small noduli. Each nodulus shows on transverse section a yellow point (centrum) which corresponds to the point of entrance of the bronchiolus.

Experience has taught us that post broncho-pneumonia atelectasis develops by animals which do not breathe sufficiently, that is, by poorly nourished and animals weakened by the processes of disease. The bronchiolitis and the alveolar catarrh give the material for the obstruction of the bronchioli, and the insufficient respiration is the cause of the obstruction. The product given by a catarrh of the part of the lungs in question is movable, consequently capable of expectoration; but the insufficient respiration is the reason why the bronchioli and the alveolæ around the same become filled. In this filling is to be sought the condition to the development of atelectasis.

Atelectasis may also embrace greater sections of the lungs; the above-given data are amply sufficient to explain the reason for the same. The diaphragma is the most important inspiration's muscle. Meteorismus and ascites must therefore exert a disadvantageous influence upon the respiration. These conditions force the diaphragma forwards, and therefore make the respiratory surface smaller and render the movement of the diaphragma difficult. Experience has taught that either of the above, of themselves, do not disturb the respiration to an excessive degree, but that dyspnœtic phenomena become apparent, when disturbances of the respiration were already present. I will not here give the reason for my assertion, but will only mention that I can prove their correctness on the dog. Dogs demonstrate scarcely any dyspnœa, by a frequently very extensive tympanitis, *i. e.* such which follows or accompanies peritonitis.

But as soon as with the tympanitis, bronchitis is developed, they demonstrate very severe dyspnœtic phenomena, even when the bronchitis has only attained a small extension. In these cases the dyspnœa stands in no proportion to the grade and extension of

the bronchitis. Tympanitis and ascites are further dangerous in that they favor the genesis of atelectasis. An indiopathic bronchial catarrh develops no atelectasis by old animals, even when the bronchioli are complicated, and a viscid mucous is secreted, the normal performance of the inspiration muscles hinders the development of bronchial obstruction. But atelectasis is, however, developed, if tympanitis or ascites are present, or become present during the prevalence of the inflammatory processes in the lungs. The latter cause a shortening of the longitudinal diameter of the thorax, they extend the diaphragma, and consequently exert a disadvantage influence upon the processes of inspiration; they render the alveolis spaces smaller, compress the bronchi, and hinder the entrance of air into the same. Atelectatic parts always take up less room than those parts of the lungs filled with air. In a lobulus atelectatic it will be found to lie below the level of the remaining air containing parts of the lungs. The pleura covering an atelectatic piece of lung shows no changes—it is smooth and transparent. Small sections of atelectatic pulmonary tissues sink if thrown into water. Atelectatic tissue does not crepitate on cutting, it is dry, and its cut surface smooth; such parts are dark or blue red in color, hyperæmic. Pulmonary tissue filled with air is of a delicate pink color, on account of the latter distribution of the blood through the distended tissue, and the opportunity given for its more perfect oxydation. An atelectatic portion of a lung must therefore have a dark red color, even though it contains no great quantity of blood; the part is retracted and the blood limited to a smaller space. The blood in such parts is at the same time more veinous because no oxygen gains access to the same. The capillaries of such parts are distended on account of the cessation of the intra-alveolic atmospheric pressure.

When a part of a lung becomes atelectatic, it is alone a consequence of retraction. If we open the thorax of a cadaver, the lungs at once fall together the moment the external air enters the thorax. The lungs are in a full condition of retraction, which can only take place, however, when the dispersion of the atmospheric pressure upon the inner (respiratory) and external surfaces

of the lungs is equal. The falling together of the lungs on opening the thorax is also the consequence of retraction, the elasticity of the lungs exerting an equal influence with the external atmospheric pressure. We know that expiration results without the employment of muscular force; it results from the endeavor of the ribs to return to their state of a quiescence, though the pressure executed by the intestines which pushes the diaphragma forwards, through the relaxation of the inspiration muscles, and from the endeavor of the elastic lungs to make themselves smaller. Muscular force is only exerted by forced expirations in order to contract the thorax, the intestines are thereby compressed, the diaphragma pushed forwards, the ribs drawn forward. The lungs of dead animals represent a condition of expiration which is not forced. This state of expiration corresponds to that grade of retraction which is possible by an intact thorax.

With the opening of the thorax is produced that equilibrium between the internal and external atmospheric pressure which we have previously considered; hereby the elasticity of the lungs becomes again active and causes a full retraction of the same. The lungs, when removed from the cadaver, exemplify this condition, on condition that they are elastic, and the respiratory tube is not obstructed. Both are stadia of the same mechanical process; in both the lungs still contain air. We must also distinguish between atelectasis and a full condition of retraction. This latter condition is caused by the equal distribution of the intra and extra pulmonic atmospheric pressure. If I decrease or remove the intra pulmonic atmospheric pressure, I then make it possible for a further retraction of the tissues of the lungs, which may finally produce atelectasis. Atelectasis is then the retraction of the pulmonic tissues until they contain no more air. The process upon the lungs is not a pathological one, it is a known physiological act, which has only appeared in an abnormal grade. Not the process, but the grade of the same is pathological.

What is then compression of the lungs?

The lungs or parts of the same may be compressed intra vitam by water, blood, fibrin, pus, tumors, etc. The fluid cet. par. assumes the lowest part of the thorax, therefore the lowest parts

of the lungs are the ones most frequently compressed. The extent of the compressed parts of the lungs depends self evidently on the quantity of fluid accumulated in the thorax. The grade of compression is dependent in part on the quantity of fluid, and, in part, on the duration of the action of the same upon the lungs. In weak grades of compression the lungs are only relieved of their atmosphere. The compressed part resembles an atelectatic part; it is dense, dry, hyperæmic, smaller than at the time of expiration, and upon transverse section the surface appears smooth. *In the extreme grades of compression, however, the parts complicated appear anæmic, it is no more hyperæmic but (by horses) appears almost white or bluish-white.*

Two conditions act by compression: 1. The external pressure; 2. The elasticity of the pulmonary tissues. During the expiration the lungs retract themselves until they attain the previously mentioned condition of expiration. The latter is that grade of retraction possible with an intact thorax. If I introduce a substance between the walls of the thorax and the lungs, I make it possible for the lungs to still more retract by means of their elasticity. In this case I do not decrease the intra-alveolic, but increase the extra pulmonic pressure. The grade of the pressure decides the amount of retraction. The pressure at first relieves the lungs from their air, and later the blood is also forced out of the same.

The elasticity of the lungs is the reason why they lose their air as well by atalectasis as by compression, but by the first the elastic action begins with the decrease of intra-alveolic atmospheric pressure, by the last with the augmentation of the extra pulmonic pressure, let the cause be air or what it will. The anæmic condition, which is apparent by the compressed lung, is not due to the elasticity of the same, for it is caused by the pressure of the fluid upon the already atelectatic pulmonory tissue.

(*To be continued.*)

PARENCHYMATOUS AND INTERSTITIAL INJECTIONS.

By J. C. MYERS, Jr., D.V.S.

Read before the United States Veterinary Medical Association.

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Concerning this important method of surgery, which is occasionally mentioned in the practise of human medicine, we really can find but little or nothing in veterinary literature, so that it may be quite proper to draw the attention of the veterinary fraternity to the advantages that can be obtained in the surgical department with the injection of medicines into the intimate structures of the afflicted tissues. Their local effect depend much upon the affinity between the certain agents injected, and the character of tissues it is intended to act upon. In accordance with this view of *modus operandi* the desired effect must be obtained by the most suitable agents in the treatment of the disease. If it be a phlegmonous tumor, a powerful irritant or suppurant is required, to set up a violent inflammation with a view of breaking down the enlargement into pus, and, when discovered, evacuated. If, on the other hand, there is a lack of vitality in the tissues or blood-vessels, producing atrophy of the connective tissues, a gentle stimulant is required, to excite the cells merely sufficient to produce an undue cell activity without driving it far enough to break the cells down into pus. This design is simply to reanimate their impaired functions. A lack of nervous force is also aroused by these and similar agents. But when there is an excess of nervous irritability, as in neuralgia, the reverse class of remedial agents are indicated to combat the disease, such as anæsthetics, anodynes, and the like. Again, there may exist a hypertrophy of glandular or osseous structures where no abscess is anticipated. In these cases absorbents are the choice agents. We often seek to establish healthy action in some malignant forms of disease. With this view we adopt as a portion of the treatment, the interstitial administrations of antiseptics, as in gangrene, anthrax, and anthro-coid diseases, where its efficient validity can be thoroughly tested. There is also another class of

medicines employed, in this or a similar way, for aneurism, by injecting coagulable material into the aneurismal sac, no doubt with some very favorable results. However, I scarcely think for this latter pathological condition the injection could be regarded as interstitial; nevertheless, it is deep.

The most frequent cases met with where this method of local medication could be employed is, in treatment of sluggish tumors and deep-seated abscesses. The advantages of proper agents injected into the intimate structures of the enlargement, over the external applications hitherto employed, are considerable. A case of chronic abscess under the levator humeri muscle at the base of the neck can be treated in a comparatively short space of time by the introduction of ʒij cantharidal collodion repeated about every third day until pus is brought to the surface, lest a violent reaction supervenes, characterized by an enormous swelling, which must be dispersed by warm bathings and appropriate lotions before another injection can be made. The changes the tumor undergoes are marked and manifested. The enlargement itself is considerably aggravated. The adjacent structures become swollen. In twenty-four to forty-eight hours the swelling sinks downwards towards the sternum and into the anterior extremity. The tumor proper is again circumscribed, probably larger, and of a more inflammatory type. In some cases the presence of pus might be detected by the fluctuation at some prominent spot. Very often, though not necessary, this at the entrance of the needle, though this puncture is usually entirely closed. If pus is detected, evacuation would next be in order; if not, another injection is indicated, not regarding the point where the original puncture was made. The operator should continue on with the injection about every third or fourth day, until indications of pus are apparent, when it should be eliminated by a bold incision. This usually reveals the presence of two cavities; one, superficial, immediately beneath the skin; the other, deep, behind a fleshy, sometimes cartilaginous partition, separating the two cavities. This septum in turn must be pierced with a probe-pointed bistoury or the index finger, to furnish an exit for the deep-seated pus—that being the important cavity. Usually the

pus is of a thick, laudable white appearance, or in rare instances, singularly indeed, of a thin black, sometimes floculated character. This discoloration is due to some pigmentry deposition. The class of abscesses above described are extremely tedious in their healing progress, which can be attributed to a melanotic cancerous diathesis the patient labors under. These are most prevalent and, indeed, almost exclusively confined to grey horses. It sometimes happens that the portion of the tumor anterior to the partition wall does not liquify, but leaves a fibrinous mass to be disposed of by the aid of escharotics. These are to be introduced after the deep cavity is plugged up. The most preferable caustic is a saturated solution of granulated chloride of zinc. Arsenic or corrosive sublimate may also be applied, but they require more time for the separation of the slough, thereby lengthening the progress of the case. Caustic potash is by some a favorite escharotic, but on account of its rapid deliquescence there is danger of injuring the integument over which it is apt to flow. This disadvantage ought to be guarded against in the use of all caustics by anointing the neighboring integuments with melted suet or wax, which prevention is far easier to accomplish than the healing of the excoriations and replacing the denuded hair. The plugging of the deep cavity, which ought to be done daily, is most conveniently and safely accomplished with a strip of worn linen saturated with carbolized oil. By this means we avoid the danger of the plug of oakum or cotton breaking and being retained within the cavity.

The author of this paper has practised interstitial injections with various agents for chronic abscess under the levator humeri muscle. The most dangerous of these, if irrationally employed, is a combination of croton oil and ether. The action of this remedy in some cases proved very alarming by producing a vehement inflammation extending over the whole visible anterior cervical region, and down through the pectoral region, causing considerable anxiety to the employer, myself, and patient. In one case gangrenic abscesses supervened throughout the pectoral and inferior cervical region, placing my patient in immediate danger of septicæmia. This result led me to discard croton oil as an

interstitial suppurant. The adjuvans (ether) forming a solution with the croton oil, by its rapid permeating influence amidst the tissues, carried the croton oil over a much greater area than intended, which could have been modified by substituting some bland oil. I therefore concluded to adopt a less potent agent for that purpose, which I am still using with flattering success. I refer to cantharidal collodium.

Tinct. cantharides or turpentine with sweet oil were my favorite remedies for a long time. But I uniformly found them unreliable and sluggish in their action. I have also tested the utility of tinct. iodine for quite a period with a view of absorbing the enlargement. In some cases this treatment was successful; in others it failed, but it favored the development of pus, which was more desirable; for I entertain the opinion that a return of the tumor need less be apprehended than if absorption had been achieved; moreover, the progress and final termination may be depended upon.

The *sub-cutaneous* injections of stimulants for atrophy of the scapular region of muscles also bring forth gratifying results towards the restoration of the volume of muscular tissue by employing such agents as will uniformly excite the cell and vascular activity, like alcohol, fusel oil, turpentine, and others. One part of fusel oil and seven parts of sweet oil proved very encouraging in several instances, but alcohol, on account of its rapid permeability, injected at intervals of three to five days, has been my latest selection. These injections should be followed by a thorough palmar friction. Their repetition should be regulated by the subsidence of the inflammation produced by the agent injected. I have also made use of tinct. cantharides, turpentine, and other stimulants, where abscesses ensued. For this complication, until further objectional developments occur, I have chosen alcohol as a local stimulant to the impoverished district of muscular tissue.

The efficacy of the deep injections of anæsthetics or anodynes, such as chloroform, ether and morphia, to allay excruciating pain, has often been achieved by the local saturation of the suffering tissues. This is particularly the case when the pain is not

attended with much evidence of inflammation, as in neuritis, rheumatism, sciatica, etc. I have repeatedly met with considerable success in the treatment of glandular bronchocele, cystic and bursal enlargements, by the injection of iodine solutions into their intimate structures. These injections for cystic enlargements are chiefly advisable after the contents of the enlargement are eliminated by means of a trocar. Especially is this treatment indicated when the cyst is in a region where there is a scarcity of loose fibrous tissue, and devoid of coagulated blood. The writer recently has treated several cases of serous cyst, almost forming abscesses, upon the withers, by the withdrawal of the fluid with a capillary trocar, followed by an injection of a weak solution of carbolic acid in one, and a mild solution of iodine in another, at intervals of four to six days.

In this manner was effected a complete convalescence in about four weeks. This treatment at the same time obviated the embarrassments of a case of fistulous withers. I do not assert that this abortive means of treatment will in all cases of serous cysts upon the withers prove successful, but there certainly can be no objection in resorting to this method of treatment before laying the cavity open with a scalpel. To secure a positive closure of the opening made by the trocar, I apply several layers of cotton saturated with collodion over the spot where the puncture had been made.

The instrument I employ for the interstitial administration of medicines is a simple hard rubber hypodermic syringe, furnished with a long strong needle. It is much safer to insert the needle into the tumor first, then adjust the syringe filled with the liquid to be injected into the meshes of the afflicted district, than to introduce the needle already attached to the syringe. The danger of breaking the needle is thereby avoided, even if the patient should resist during the operation.

The judicious selection of agents, both in quality and quantity, is absolutely essential to convince one of the efficiency established by this mode of treatment. It requires considerable skill and experience to determine the necessary quantity to produce the desired effect. It is decidedly material when the repetition of

the injection is effected, for the succeeding operation must act in conformity with the preceding one.

As brief as this paper is, I hope its contents are demonstrative and explicit enough to enable the veterinary practitioners to energetically advocate the interstitial administration of medicines for the above described affections.

REPORT OF CASES.

RUPTURE OF THE ÆSOPHAGUS—RECOVERY.

By E. F. Thayer, V.S.

West Newton, Mass., June 19, 1863.

I was called to a horse belonging to C. E. Townsend, of Granville, four miles distant. The statement was that the animal was frightened by a straw hat, which was blown off the head of the driver, which caused him to run away, throwing over the horse and cart; the horse could hardly breathe, and the throat was badly swollen. On examination I found an extensive swelling over the region of the fauces, filling the intermaxillary space, and extending downward and backward for six or more inches, the animal breathing with great difficulty. I at once opened the trachea and inserted the tube, which immediately relieved the breathing, and applied a digestive ointment over the swollen part. On the 24th there was fluctuation. An opening was made, and a large quantity of pus escaped. A little green clover was given to eat and in a few minutes I found the grass passing out of the opening made by the lancet. I then ordered that all solid food be discontinued and gruel substituted. On the 27th I again visited the animal, and found that my orders were not obeyed. As the owner was a merchant and absent from home most of the time, I requested that the horse be sent to my place, which was done. I made a pad with tow and chamois to fit the aperture, and allowed a liberal quantity of gruel, which he drank with avidity, but little escaping through the wound. In four weeks he was sent home, the external wound having entirely healed, the food passing down without any obstruction; the animal could trot a lively gait without difficulty of respiration. It was soon found that the fright was a serious matter; that he was afraid of anything in motion, and as an old gentleman (the owner's father), drove him and used him on the place, it was thought unsafe to keep him; he was sold to go into the army. The case was interesting, from the fact that there was no permanent injury to the organs of deglutition or respiration.

EDITORIAL.

AMERICAN VETERINARY REVIEW.

As we announced it in the last number of our first volume, the life of the REVIEW is now a certain thing, and the fear that some of our friends might have entertained towards its permanent success is now a doubt of the past, much, probably, to the discomfiture of a few.

But watching, as we have done for years past, the progress of veterinary medicine in America, and satisfied as we are of the importance of such a periodical, we felt that the mere fact of starting this publication was not sufficient, and that unless marching with the advancement of our science and making improvements in its appearance, we would not do justice to the great patronage we have received. To that effect, and with that object in view, we have taken steps to have the REVIEW increased in size; and we are pleased to announce, that from this first number of our second volume, each month will bring to our readers 46 pages of reading matter. Our correspondents now will not have to wait for months to see their articles published, and our subscribers will thus be always kept posted as to the most advanced progress of veterinary medicine.

A cheap publication is not always the best, it is true, but low price does not necessarily exclude quality—and in this, also, we have made progress. The REVIEW is now offered for $4.00 a year, and will make at the end of the year a nice volume of about 500 pages of interesting reading subjects.

We hope that with these changes Veterinarians of the United States will continue to look upon the REVIEW as the true representative of American Veterinary medicine, and as the means of protecting their professional interest; and in so doing will still give us their patronage and their kind assistance.

VETERINARY COLLEGES.

No one will deny, that if the standing of the veterinary profession is yet so low in the United States, it is not due to the

ridicule which may be attached to the practice of that specialty of medicine, but to the fact that in the greatest majority of cases, those who are engaged in veterinary practice are of the greatest ignorance; or, if regularly educated, have prostituted their professional standing by empirical and charlatanic conduct.

This condition, however, is rapidly coming to its end, and that is, thanks to the establishment of veterinary schools on the continent of North America. These schools have been private undertakings. It has been with them a hard up-hill work, and especially in the United States, where they had to depend almost entirely for their support and success on the energy of a few men, without any Governmental assistance; but nevertheless, their work will forever be marked on the stones of posterity, which will judge of what was good and what was bad in the performance of their labors. In the United States, though several attempts were made to the establishment of veterinary schools, we find, yet, that only two institutions truly came to a certain success. One was chartered in 1857, the other in April, 1875—the second being founded by the working faculty of the former, which was closed in March, 1875. These are now in working condition. While it is gratifying to see these two schools working with the same object in view, it is to be much regretted that the revived school should, by erroneous statement, try to impugnate the legal existence of the other. In some newspapers, and in their advertisements, she claims that she is the only school chartered by special act of the Legislature. This is correct; but why follow it by a misrepresentation of her rights in saying that she is the only one authorized to issue diplomas?

There are in the State of New York three ways by which educational institutions can be incorporated: 1st, by special act of the Legislature; 2d, by authority of the Board of Regents of the University of the State of New York; 3d, under the general law of the State, (laws of 1870, amending Act of 1848). These laws read as follows:

LAWS OF NEW YORK, 71ST SESSION, 1848. CHAPTER 319.

AN ACT FOR THE INCORPORATION OF BENEVOLENT, CHARITABLE, SCIENTIFIC AND MISSIONARY SOCIETIES, PASSED APRIL 12TH, 1848.

The people of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. Any five or more persons of full age, citizens of the United States, a majority of whom shall be citizens of this State, who shall desire to associate themselves for benevolent, charitable, *scientific*, or missionary purposes, may make, sign, and acknowledge before any officer authorized to take the acknowledgment of deeds in this State, and file in the office of the Secretary of State, and also in the office of the Clerk of the county in which the business of such society is to be conducted, a certificate in writing in which shall be stated the name or title by which such society shall be known in law, the particular business and objects of such society, the number of trustees, directors or managers to manage the same, and the names of the trustees, directors, or managers of such society for the first year of its existence; but such certificate shall not be filed unless by the written consent and approbation of one of the justices of the Supreme Court of the district in which the place of business, or principal office of such company or association, shall be located, to be endorsed on such certificate.

LAWS OF NEW YORK, 93D SESSION, 1870. CHAPTER 51.

AN ACT TO AMEND THE "ACT FOR THE INCORPORATION OF BENEVOLENT, CHARITABLE, SCIENTIFIC, AND MISSIONARY SOCIETIES," PASSED APRIL TWELFTH, EIGHTEEN HUNDRED AND FORTY-EIGHT.

The people of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. The Act for the incorporation of benevolent, charitable, *scientific* and missionary purposes, passed April twelfth, eighteen hundred and forty-eight, shall be deemed to authorize the incorporation of any society for the purpose of *establishing and maintaining any educational institution, &c., &c., &c.*

SECTION 3. Any *university or college* incorporated under the said Act, or under this Act, may take and hold, by gift, grant, devise, or bequest, &c., &c., &c.

What reads plainer than this? Is the American Veterinary College the only institution which has availed itself of the privileges of these laws? No. The *University of Syracuse* is chartered under the same power. Its literary, legal, theological and medical departments issue their diplomas by the same right; and were ever those degrees contested by any other institution?

Why then deny it to the American Veterinary College; to one whose faculty has worked hard and earnestly for thirteen years; whose alumni are spread all over our continent, and endeavoring, by their efforts and their labors, to keep the work undertaken by their alma mater.

JURISPRUDENCE.

VETERINARY JURISPRUDENCE.

Read before the Montreal Veterinary Medical Association, by D. McEachran, F.R.C.V.S., President.

CONTINUED FROM PAGE 437, VOL. I.

WARRANTY.

Before noticing the diseases which are considered to be unsound, I will briefly notice the laws relating to sale and warranty. In England, a purchaser has no case unless he has a warranty, or unless fraud can be proved on the part of the seller.

"By the civil law every person is bound to warrant the thing he sells, or conveys, although there is no express warranty; but the common law binds him not, unless there be a warranty either in deed or in law, for *caveat emptor;* the meaning of this Latin expression is that the buyer takes the article sold with all its defects, and must not look to the law for any defects if its intrinsic worth does not correspond with its outward appearance. It cautions the buyer, therefore, according to the Italian proverb, that he has need of a hundred eyes, the seller of only one. By the law of England, warranties are divided into *express* and *implied;* the latter, however, differ in no respect from the former, except in the circumstance of proof. The intention to warrant is collected from the whole tissue of circumstances proved, as a legitimate deduction from them, like the presumption of any other part not established by direct evidence; while the express warranty is proved by direct and express testimony to the fact

itself. A warranty may also be *general* or *qualified*; as: "Received from A. B. $150 for a bay gelding, six years old, warranted sound," is a general warranty and makes the seller liable for all faults known and unknown to him; or, "Received from A. B. $150 for a grey mare sound except a curb on left hock"—this is a qualified warranty, and the seller accepts the risk of the curb mentioned specially.

"No particular words are necessary to constitute a warrant, and it is not necessary to say 'I warrant;' it is sufficient if he says the article is of a particular quality, or is fit for a particular purpose. The general rule laid down by Mr. Justice Bayley is, that whatever the vender represents at the time of sale is a warranty. Therefore, if a person at the sale says, 'You may depend upon it, the horse is free from vice,' it is a warranty. There was at one time a general opinion that a *sound price* given for a horse was tantamount to a *warranty* of soundness, but Lord Mansfield considered the doctrine to be so loose and unsatisfactory, that he rejected it and laid down the following rule: There must either be an *express warranty* of soundness, or fraud in the seller, to maintain an action. (Oliphant 114). With regard to the length of time a warranty shall extend, there does not appear to be any rule on the subject. It is distinctly laid down, however, by Lord Longborough on Fulder & Starkin, that no length of time elapsed after a sale will alter the nature of a contract originally false. It is also laid down by the late Lord Chancellor Eldon, when Chief Justice of the Court of Common Pleas, in the case of Curtis & Hannay, that if a person purchases a horse which is warranted and it afterwards turns out that the horse was unsound at the time of the warranty, the buyer may, if he pleases, keep the horse and bring an action on the warranty, in which he will have a right to recover the difference between the value of a sound horse and one with such defects as existed at the time of warranty, in which he may take an action to recover the full money paid." (Nimrod).

Blackstone says, "A warranty can only reach to things in being at the time of the warranty, and not to things in future; as a horse is sound at the time of buying him, not that he will be sound two years hence." I find the following legal facts com-

piled in the *Lower Canada Jurist* in Teasle & Prier: "To constitute a warranty in the sale of a horse, no particular language is required, and it may be stated as a general principle that whatever the vender represents at the time of the sale is a warranty. It is not essentially necessary (2 Stephens N. P. 1289) that the false statement of the defendant be accompanied with an intention to injure the plaintiff, because the legal fraud which is sufficient to sustain the action is complete when the intention to mislead is followed by actual injury, (ib. p. 1305)." * * "A verbal representation of the seller to the buyer of a horse in the course of dealing, that he may depend upon it, the horse is perfectly quiet and free from vice, is a warranty." (3 M. & R., p. 2). "If the vendor is cognizant of any defect in the thing sold, materially lowering its value in the market, the law implies a promise from him to make disclosure thereof, and the passing over in silence of an important fact or circumstance which ought in good faith to be known, is equivalent in contemplation of law to an express representation or even a warranty." (Addison on Contracts p. 55.) "Ordinary praise will not notate the contract or a mere expression of an opinion." (H., p. 129). "If there has been a *suppressio veri* or concealment of the truth, that alone, in certain cases and under certain circumstances, will amount to a fraud." (H., p. 130). "There was a fraudulent concealment notating the contract, when the vender of a mare stated at the time of the sale that he believed the mare to be sound, but would not warrant her, and the mare was unsound to his knowledge." (Wood *vs.* Smith, R. & M., p. 124). "If a purchaser makes no inquiries as to the soundness of the animal, and the vender has said or done nothing to throw the purchaser off his guard or to conceal a defect, there is no fraudulent concealment on the part of the vender." (Jones *vs.* Bright, R. & M., 175).

"In France and in this Province a legal warranty attaches upon the seller, but the legal warranty is for the same purpose as the English conventional warranty, the protection of the purchase against latest defects and diseases which are presumed to be within the knowledge of the horse-dealer, and not of occasional buyers.

"The article 1641 of the French Code has been transferred into our Civil Code under its article 1522.

"1522.—The seller is bound by law to warrant the buyer against such latent defects in the thing sold and its accessories as to render it unfit for the use for which it was intended, or so diminish its usefulness that the buyer would not have bought it, or would not have given so large a price if he had known them.

"1523.—The seller is not bound for defects which are apparent, and which the buyer might have known of himself.

"1524.—The seller is bound for latent defects, even when they are not known to him, unless it is stipulated that he shall be obliged to any warranty."

To be continued.

MEETINGS OF SOCITIES.

MEETING OF THE AMERICAN VETERINARY COLLEGE ALUMNI ASSOCIATION.

The first regular annual meeting of the American Veterinary College Alumni Association was held in the lecture room of the American Veterinary College, on February 28th, 1878. The meeting was called to order by C. B. Michener, at 11:30 A. M. On motion of A. A. Holcombe, seconded by P. Nostrand, Ernest Travers was elected chairman of the meeting. The following members were present: A. A. Holcombe, J. C. Corlies, P. Nostrand, E. Travers, C. B. Michener, W. J. Coates, C. H. Hall, C. H. Peabody, G. P. Penniman.

J. F. Winchester, Samuel S. Field, J. C. Force, Alvord H. Rose, William G. Schmidt and W. H. Wray were admitted as members of the Association. A. A. Holcombe, J. C. Corlies and E. Travers, the Committee appointed to draft a Constitution and By-laws, reported, and the report was accepted with a few slight additions and alterations.

The following officers were elected, by ballot, for the ensuing year: President, A. A. Holcombe; Vice-President, E. Travers;

Secretary. C. B. Michener; Treasurer, J. C. Corlies; Librarian, A. H. Rose. Julius C. Force was appointed a committee of one to conduct the newly-elected President to the chair. The President then appointed a Library Committee, consisting of W. J. Coates, Peter Nostrand and E. Travers; as Executive Committee, S. S. Field, Alvord H. Rose, C. H. Hall, J. C. Corlies and C. H. Peabody. The Vice-President was called to the chair, and A. A. Holcombe, with some terse remarks, introduced the following preamble and resolutions, which were *unanimously* adopted:

Whereas, The American Veterinary College has been repeatedly maligned by divers persons connected with the New York College of Veterinary Surgeons, in circulating the report that the last-named institution is the *only* one in the State chartered by the Legislature, and authorized to issue diplomas; and

Whereas, Such reports tend to cripple the American Veterinary College, by destroying the confidence of the public in the legality of its charter and the validity of its diplomas; therefore, be it

Resolved, That we, the Alumni of the American Veterinary College, in concourse assembled, do respectfully petition the Trustees of said College to take such steps as they may deem proper to arrest the circulation of all falsehoods and misstatements tending to impair our professional standing.

This measure was warmly supported by the Association, and the Secretary was instructed to forward a copy of the preamble and resolutions to the Board of Trustees.

By motion of C. B. Michener, the President was directed to appoint two members to read essays at the next regular meeting. Drs. Michener and Travers were selected.

The meeting then adjourned to meet in New York City about March 1st, 1879.

C. B. MICHENER,
Secretary.

VETERINARY HONORS.

Prof. D. McEachran, F.R.C.V.S., Principal of the Montreal Veterinary College, was unanimously elected Honorary

Member of the United States Veterinary Medical Association at the last semi-annual meeting, held in Boston, March 19th inst.

We are pleased to inform our readers that Prof. F. W. Prentice, M.R.C.V.S.L., of the Illinois Industrial University, has satisfactorily passed his examination for the degree of M.D., before the Cincinnati College of Medicine and Surgery. The step taken by Prof. Prentice to obtain his title of M.D., is one which cannot be too much encouraged in this country as a means of obtaining from the public the respect which is so much due to veterinary science. We believe that there are now in America more veterinarians, graduates of human medicine, than in any other part of the world.

CORRESPONDENCE.

CHICAGO, ILLS., March 12, 1878.

PROF. A. LIAUTARD, EDITOR AM. VETERINARY REVIEW:

DEAR SIR: I have sent to you a printed copy of a paper on veterinary sanitary reform, which was prepared by me, and read at the meeting of the National Agricultural Congress, in Washington, D. C., on the 20th day of February, this year, by the Secretary of said Congress, before a large audience. There were present members of both houses of the National Congress, and delegates, regularly appointed by State Boards of Agriculture, agricultural colleges, State Granges, and other prominent agricultural organizations, representing twenty-two States and Territories, besides delegates from five of the civilized Indian nations. The merits of the paper were argued by Drs. Snodgrass, Cochrane, Periam, and others. It was referred to the Committee on Business, and the following resolution in relation to the matter, by Dr. Snodgrass, was adopted:

"*Resolved*, That veterinary practice in this country is quite too generally unscientific and empirical; that the need of educating skilled veterinarians is imperative, and the attention of agricultural colleges is respectfully and urgently directed to more vigorous efforts in this direction."

Need I tell you that I was very much disappointed on reading

the above resolution? I am confident that every veterinarian in the land, having the interests of his profession at heart, will regard this resolution as tending more to frustrate, than to further the interests of the public, as well as of veterinary science. Will the National Government be likely to do much in this direction with the example before it of the indifferent manner in which this matter was treated by the representatives of the very people who are most interested in the progress of veterinary science?

"*That veterinary practice in this country is quite too generally unscientific and empirical*," is something that everybody knows, and is the reason why my paper was presented. I doubt "*that the need of educating skilled veterinarians is imperative;*" skilled veterinarians in America are generally educated men. "*The attention of agricultural colleges is respectfully and urgently directed to more vigorous efforts in this direction.*" What vigorous efforts can be expected of these institutions who class veterinary science as a third or fourth-rate sub-division, and many of which do not even consider it worth employing a qualified veterinarian as teacher? The inducements offered by those of the agricultural colleges who employ veterinary teachers, are not calculated to secure the best talent; in fact, the salary offered is a mere pittance, the acceptance of which is next to a degradation to the person who accepts it.

Until the agricultural colleges can be made to understand that it requires at least three veterinary professors (instead of only one lecturer) to teach veterinary science as it should be taught, to insure proper education in this branch of medical science, just so long will the sentence in the above resolution, calling upon the agricutural colleges, remain worthless.

Yours respectfully, N. H. PAAREN.

COMMUNICATIONS RECEIVED.

F. S. Billings, Berlin; J. C. McKenzie, Rochester; N. H. Paaren, Chicago; E. F. Thayer, Boston; N. S. Townshend,

M.D., Columbus; Robert Wood, Boston; C. B. Michener, Carversville; D. McEachran, Montreal; J. Gerth, Jr., Berlin.

EXCHANGES AND JOURNALS.

Journal del' Agriculture, Paris; Scientific American, New York; Turf, Field and Farm, New York; Medical Record, New York; Hospital Gazette, New York; Western Sportsman, Indianapolis; Archives Veterinaires, France; American Agriculturist, New York; Scientific Farmer, Boston; Country Gentleman, New York; Western Farm and Live Stock Journal, Chicago; Mouvement Medical, Paris; National Live Stock Journal; Revue fur Thierheilkunde und Thierucht.

PAPERS RECEIVED.

Weekly Gazette, Montreal; The Press, Boston; Daily Kansas City Mail, Our American Farmer; Prairie Farmer, Chicago; Leader, Canada; Troy Daily Times; Veterinarian; Practical Farmer.